

WHAT IS CLAIMED IS:

1. A data acquisition system comprising:
 - a control system in communication with a data capture module, the data capture module in communication with a processing system;
 - the control system operable to selectively send trigger commands to the data capture module, each trigger command having a corresponding incremental trigger number;
 - the control system having a trigger counter for storing the trigger number of the most recently sent trigger command;
 - the data capture module operable to generate an output image corresponding to an associated target and send the output image and the corresponding trigger number to the processing system in response to the trigger command;
 - the processing system comprising a plurality of discreet processing resources, each processing resource operable to process an output image;
 - the processing system operable to periodically send a status message to the control system, the status message comprising a message ID, the last trigger number received by the processing system, and the number of available processing resources; and
 - the control system operable to limit the number of new trigger commands sent to the data capture module based on the status message having the highest message ID and the trigger counter.

2. The data acquisition system of claim 1 wherein the data capture module comprises a CCD camera.

3. The data acquisition system of claim 1 further comprising:

the control system connected with the data capture model via a one-way communication channel;

the data capture module connected with the processing system through a one-way communication channel; and

the processing system connected with the control system through a network.

4. The data acquisition system of Claim 3 further comprising the processing system in communication with the controller via an Ethernet connection.

5. The data acquisition system of Claim 1 further comprising the control system in communication with a positioning system, the positioning system operable to selectively position the associated target with respect to the data capture module.

6. The data acquisition system of Claim 1 further comprising the data capture module operable to transmit digital holographic image data to the processing system.

7. The data acquisition system of Claim 1 wherein the processing system comprises at least ten processors.

8. The data acquisition system of Claim 1 control system operable to limit the number of trigger commands by:

selecting the status message having the highest message ID;

adding the number of available processors in the selected status message and the trigger number of the selected status message;

subtracting the trigger number stored in the trigger counter; and

using the result to limit the number of new trigger command sent to the data capture module.

9. The data acquisition system of Claim 1 further comprising the controller having a message counter for recording the message ID of the highest message ID received by the controller, the controller operable to disregard received status messages having a lower message ID than the message ID stored in the message counter.

10. The data acquisition system of Claim 1 further comprising the image processing system operable to generate a status message when a processing resource completes the processing of an output image.

11. The data acquisition system of Claim 1 further comprising the image processing system having a trigger counter operable to record the last trigger number received from the data capture module.

12. The data acquisition system of Claim 1 further comprising the image processing system having an available processor module for determining the number of available processors within the image processing system.

13. A data acquisition management system comprising:

- a first system in communication with a second system through a one-way communication channel;

- the first system operable to selectively trigger the acquisition of an output file to be sent to the second system for processing, each trigger having a corresponding incremental trigger number;

- the first system having a trigger counter for storing the trigger number of the most recently sent trigger command;

- the second system comprising a plurality of discreet processing resources, each processing resource operable to process an output file received from the first system;

- the second system operable to periodically send a status message to the first system via a network, the status message comprising a message ID, the last trigger number received by the second system, and the number of available processing resources; and

- the first system operable to limit the acquisition of output files based on the status message having the highest message ID and the trigger counter.

14. The data acquisition management system of claim 13 further comprising a CCD camera operable to capture holographic image data corresponding to an associated target.

15. The data acquisition management system of Claim 13 further comprising the first system operable to limit the number of output files by:

selecting the status message having the highest message ID;

adding the number of available processors in the selected status message and the trigger number of the selected status message;

subtracting the trigger number stored in the trigger counter; and

using the result to limit the acquisition of data by the first system.

16. The data acquisition system of Claim 13 further comprising the first system having a message counter for recording the message ID of the highest message ID received, the first system operable to disregard received status messages having a lower message ID than the message ID stored in the message counter.

17. A method of managing a data acquisition system comprising:

sending a trigger command from a control system to a data capture module, the trigger command having a corresponding incremental trigger number;

recording the trigger number of the most recently sent trigger command in a trigger counter;

generating an output image corresponding to a target associated with the data capture module in response to the trigger command;

sending the output image and the corresponding trigger number to a processing system have a plurality of discreet processing resources, each processing resource operable to process an output image;

periodically sending a status message from the processing system to the control system, the status message comprising a message ID, the last trigger number received by the processing system, and the number of available processing resources; and

limiting the new trigger commands sent to the data capture module based on the status message having the highest message ID and the trigger counter.

18. The method of Claim 17 wherein limiting the new trigger commands further comprises:

selecting the status message having the highest message ID;

adding the number of available processors in the selected status message and the trigger number of the selected status message;

subtracting the trigger number stored in the trigger counter; and

using the result to limit the number of trigger commands sent to the data acquisition module by the control system.